

OPTICAL PHENOMENA.

Solar Halos were observed on the following dates in the different districts: New England, 1st, 21st, 24th, 25th, and 29th; Middle Atlantic States, 1st, 2nd, 3rd, 7th, 21st, 23rd, 25th, 28th, 29th, and 30th; Florida, 18th and 20th; Western Gulf States, 10th, 14th, 24th, 28th and 29th; Ohio valley, 7th, 9th, 12th, 13th, 15th, 19th, 27th, 28th, 29th and 30th; Michigan, 17th and 22nd; Upper Mississippi valley, 4th, 5th, 10th, 11th, 14th, 15th, 28th and 29th; Lower Missouri valley, 8th, 12th, 14th, 15th, 18th, 24th and 27th; Northwest, 3rd, 4th, 9th and 28th; Utah, 7th, 8th and 26th; California, 25th and 27th; Oregon, 1st.

Lunar Halos were observed on the following dates in the different districts: New England, 1st, 2nd, 23rd, 24th to 30th; Middle States, 1st, 2nd, 12th, 22nd, 23rd, 25th, 28th to 30th; South Atlantic States, 2nd, 3rd, 22nd to 29th; Gulf States, 2nd, 22nd, 23rd, 24th, 27th to 30th; Ohio valley and Tennessee, 10th, 24th, 26th to 30th; Lower Lakes, 1st, 2nd, 12th, 25th, 27th, 28th; Upper Lakes, 11th, 24th, 28th, 29th; Upper Mississippi valley, 1st, 2nd, 5th, 15th, 23rd, 26th to 30th; Lower Missouri valley, 26th to 30th; Northwest, 7th; Utah, 22nd, 25th, 26th; Nevada, 29th; California, 25th; Oregon, 28th.

MISCELLANEOUS PHENOMENA.

Prairie and Forest Fires.—Ft. Sill, 2nd, 7th, 8th, 9th, 10th, 15th, 20th, 27th; Bismarck, 2nd, 25th; Pembina, 29th, 30th; Ft. Gibson, 7th, 8th, 9th, 17th, 23rd, 26th, 30th; Cheyenne, 7th, 8th; Colorado Springs, Col., 13th, in mountains; Pike's Peak, 5th, in mountains; Santa Fé, 12th, 13th, 15th, 16th, 17th, 18th, in mountains; Salt Lake City, 16th, in mountains; Burlington, Vt., 1st, 2nd, in mountains; Hermosa, Col., 15th, 16th, 17th, 18th; Morristown, Dak., 21st; Los Angeles, Cal., 12th, 13th, 14th and 15th, in mountains, destroying large tracks of timber; Ft. Stevenson, Dak., 25th and 26th; Breckenridge, 8th; Ft. Garland, Col., 8th and 9th, on mountains; Boise City, 13th, in mountains; Creswell, Kans., 14th, 15th, 16th; Clear Creek, Neb. 7th.

Mirage.—New Haven, Conn., 12th.

Meteors.—On the 5th, a very brilliant meteor was observed in Nevada and Utah, of which the following reports are to hand: Salt Lake City, 7:10 p. m., brilliant meteor appeared a few degrees south of west, and shot across the sky in a northwesterly direction, leaving behind it a bright silvery streak 7° in length, and resembling a cloud. One striking peculiarity of this streak, was its resemblance to certain letters of the alphabet, two W's being plainly visible and followed by a succession of N's. It disappeared at 7:25 p. m., having at that time, a pinkish color, the sky, during the whole time, being perfectly clear. The meteor did not appear much larger than an ordinary star. Pioche, Nevada, 6:40 p. m., brilliant meteor, at from 35° to 40° above the western horizon. Motion, at first, from east to west, when it turned rapidly to the northwest and with a hissing noise, fell to the earth, about 40 miles from the station. It left a train, which was visible for 45 minutes; sky perfectly clear. Deep Creek, Utah, 7:30 p. m., brilliant meteor, passing from SE. to SW., leaving a silver streak in its wake, lasting fully twenty minutes. It was also observed at Austin, Nev. At Chattanooga, on the 15th, 11 p. m., a very bright meteor, passing from zenith to NW. horizon, leaving in its wake a pale yellow cloud.

Sunsets—The characteristics of the sky at sunset, as indicative of fair or foul weather, for the succeeding twenty-four hours, have been observed at all Signal Corps stations. Reports from 140 stations show 4,195 observations to have been made, of which 30 were reported doubtful; of the remainder 3,575 or 85.2 per cent were followed by the expected weather.

Zodiacal Light.—New Corydon, Ind., 17th, 19th, 21st, 25th, 26th; Palermo, N. Y., 16th, 20th; Fayetteville, N. C., 15th; Lynchburg, Va., 5th, 15th.

Earthquakes.—At Memphis, Tenn., on the 25th, at 9.10 p. m. a very perceptible shock; duration, six seconds; direction, from NW. to SE.

Polar Bands.—New Corydon, Ind., 6th, 7th, 11th, 19th, 29th; Guttensburg, Ia., 19th; Tabor, Ia., 15th; Waterburg, N. Y., 10th, 11th; Portland, Or., 20th; Clear Creek, Neb., 18th and 19th.

Sun Spots.—The following record of observations, made by D. P. Todd, Assistant, has been forwarded by Prof. S. Newcomb, U. S. Navy, Superintendent Nautical Almanac, Washington, D. C.:

[illegible]

Observations were also made on the 10th, 12th, 18th and 23rd at 3 p. m., on the 11th at 9 a. m. and 4 p. m. and on the 15th, 19th and 22nd at 4 p. m., but no spots seen at these hours. Mr. David Trowbridge at Waterburg, N. Y., examined the sun on the 8th, 10th, 11th, 12th, 14th, 16th, 17th, 19th, 20th, 21st, 22nd, 23rd, 30th, but observed no spots. On the 1st, 4th, 5th, 6th, 7th, 25th, 26th 27th, "spots re-appeared by solar rotation." Mr. H. D. Gowey at North Lewesburg, Ohio, reported as follows: 4th, 7:30 a. m. one spot; never observed a spot as far north of the sun's equator before. Observations were also made at Ft. Whipple throughout the month, but no spots seen.

Locusts.—Genoa, Neb., 1st, 7th and 12th, flying southeast; Fort Sill, I. T., 11th, moving south in great swarms, very few alighted; Leavenworth, Kansas, 12th, p. m. large numbers observed flying too high to distinguish direction, very few alighted; Weatherford, Texas, 23rd, large numbers have disappeared in the Keachi valley to the southward; Jacksboro, Texas, 13th, 14th and 15th, in large numbers, doing great damage to cotton plants, 16th, disappeared; Henrietta, Texas, 10th and 15th, large numbers passed over station, from northwest to southeast, no damage done; Graham, Texas, 14th, vast numbers seen moving to the southward; Creswell, Kansas, 1st, 2nd and 3rd, flying south, very few alighting. 7th, southwest, 12th and 13th, south; Clear Creek, Neb., 2nd, flying south; Walla Walla, W. T., 3rd, very large numbers flying high in the air, very few alighting; for the past two weeks they have been appearing in variable numbers.

Geese.—Princeton, Cal., 14th, first appearance; Genoa, Neb., 23rd, flying south; Pembina, 14th, flying north; Keokuk, 13th, flying south; Creswell, Kan., 14th, flying south; Clear Creek, Neb., south, 16th, 20th, 23rd.

NOTES AND EXTRACTS.

[From London Quarterly Journal, January, 1879.]

"*Meteorology of Bangkok, Siam*.—By J. CAMPBELL, Staff-Surgeon R. N.—The following observations were made at Bangkok, the Capital of Siam, during the years 1858-1868, omitting 1862. A glance at a map of Indo-China will show that that kingdom, Muang Thai, the Land of the Free, has a geographical position such as to preserve it from the heat, deluges of rain and devastating cyclones so common to adjoining countries; the elevated land of the Malayan Peninsula, Burmah and the Gulf of Siam, contributing largely to an anomalous state of things, and which meteorologically considered will be apparent in the tables herein given.

"The instruments employed were partly private during the first four years, but they were compared at Kew with standards. The last six years' records were entirely from those supplied by the Meteorological Department of the Board of Trade. The rain-gauge during the first four years was of my own construction. Up to April, 1859, the barometer was a mercurial one—Government—but it got out of order, and till 1863 I depended on an aneroid. This instrument evidently deteriorated yearly, though slightly. It is, however, evident that the first two instruments were originally at a less height than the barometer of the last six years. Up to May, 1859 the instruments were placed in the north verandah of a floating house, 7 ft. above tidal influence, the rain-gauge 20 ft. above the river, so as to be higher than the houses and completely secluded from the sun; after the above date they were placed, for a time, in a large airy room of my house on land, and subsequently in its north verandah, at an elevation of 21 ft. above high water level. The rain-gauge was at an elevation of about 45 ft., but for the last two years it was only 3 ft. above high water. These changes of elevation ought, theoretically considered, to have a disturbing influence on the regularity of the items recorded, excepting the barometer; but such does not appear to have ensued to any appreciable extent.

"*Barometer*.—The pressure of the atmosphere attains its maximum in December, sometimes in January, and then falls till June, July or August, when its maximum is reached: these are uninfluenced by any local causes, an unusual inundation, much rain, drought or heat having no observable effect upon the height of the mercurial column of its daily tides, which takes place about 3½ a. m. and p. m. for minima, and 9½ a. m. and p. m. maxima. The range is about 0.110 in., but occasionally it amounts to 0.180 in.

"*Temperature*.—The lowest temperature of the year occurs in December, though sometimes it may be in November, January or February, and the highest usually takes place in April, but it may be noticed in the preceding or subsequent month. In this record the minimum, 57°, took place in December, and the maximum, 97°.5, in May. The monthly means make the extremes in December and April. The *Tension of Vapor* follows a similar rule, viz. the lowest in December and highest in May, but the tables of *Humidity* and *Rain-fall* are different; these agree in making December the minimum and September the maximum of the year. The years 1859 and 1864 were remarkable for little rain, years of drought, in 1865 rice was imported, whilst 1860 and 1868 were the years of greatest rain-fall.

"*Hail* occurred only once, one afternoon, during my residence of fifteen years.

"*Winds*.—In September the SW. monsoon becomes weak; early in October N. breezes set in, varying from W. to E. by the northern segment, and during this month or November the NE. monsoon is quite established. Throughout December it continues strong, but in January it has lost half of its last month's vigour, and in February retains only a fifth of its original force; the deficiency being in part made up by an increase of wind varying from SSE. to SW. By the end of the month or early in March the N. winds have ceased and strong breezes from S. and SSW. prevail, locally termed the Kite and Junk winds. It is in April that the greatest heat takes place, and for two or three nights in succession, if no breeze stirs the air, the plight of foreigners, ay even of natives, is not to be envied. During the months of May, June, July and August, the SW. winds are strong and constant, sometimes boisterous, the direction being chiefly S. and SSW. till June, and thence SW. to September, when light variable winds are the rule, and foretell a breaking up of the SW. monsoon."